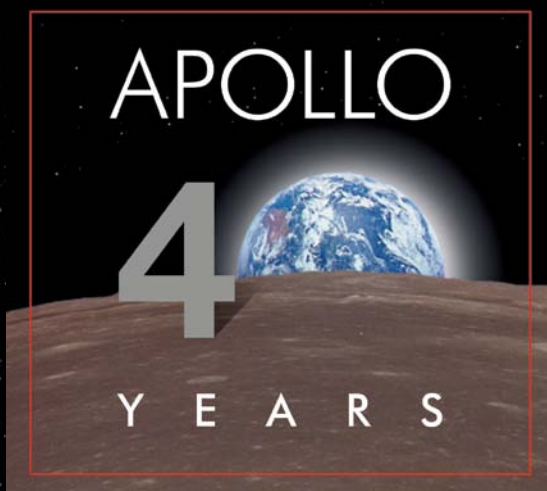




Celebrating the Past **LAUNCHING THE FUTURE**



marshall activity guide

"President Kennedy boldly declared before a joint session of Congress that the United States would send a man to the moon and return him safely to the Earth. The scientific community rallied behind this goal and set about achieving it. And it would not only lead to those first steps on the moon; it would lead to giant leaps in our understanding here at home."

President Barack Obama,

Remarks before the National Academy of Sciences, April 27, 2009

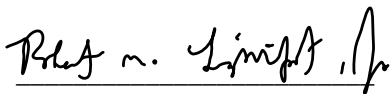
We echo President Obama's comments and are pleased to join together to celebrate a significant space exploration milestone—the 40th anniversary of the Apollo 11 moon landing.

The Marshall Space Flight Center and the U.S. Space & Rocket Center have enjoyed a special relationship over the years as partners in communicating NASA's exciting work. Our relationship is steeped in the historical beginnings of the U.S. space program and continues to flourish today, as evidenced by the awe-inspiring exhibits found in the Davidson Center for Space Exploration and throughout the museum.

Our celebration in Huntsville coincides with Apollo 40th anniversary events in Washington, DC, on July 20, including special events with the Apollo 11 crew and other Apollo astronauts at the Smithsonian's National Air and Space Museum.

This is a day for the Marshall family to come together and relive the remarkable successes achieved by the men and women who made the Apollo program one of the most significant accomplishments of humankind—and to embrace the challenges that lie before us as we continue the journey.

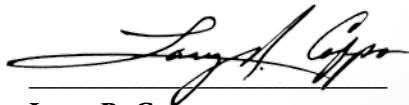
Thank you for joining in the celebration. Without you, the next footprints on the moon would not be possible.



Robert M. Lightfoot

Acting Director

Marshall Space Flight Center

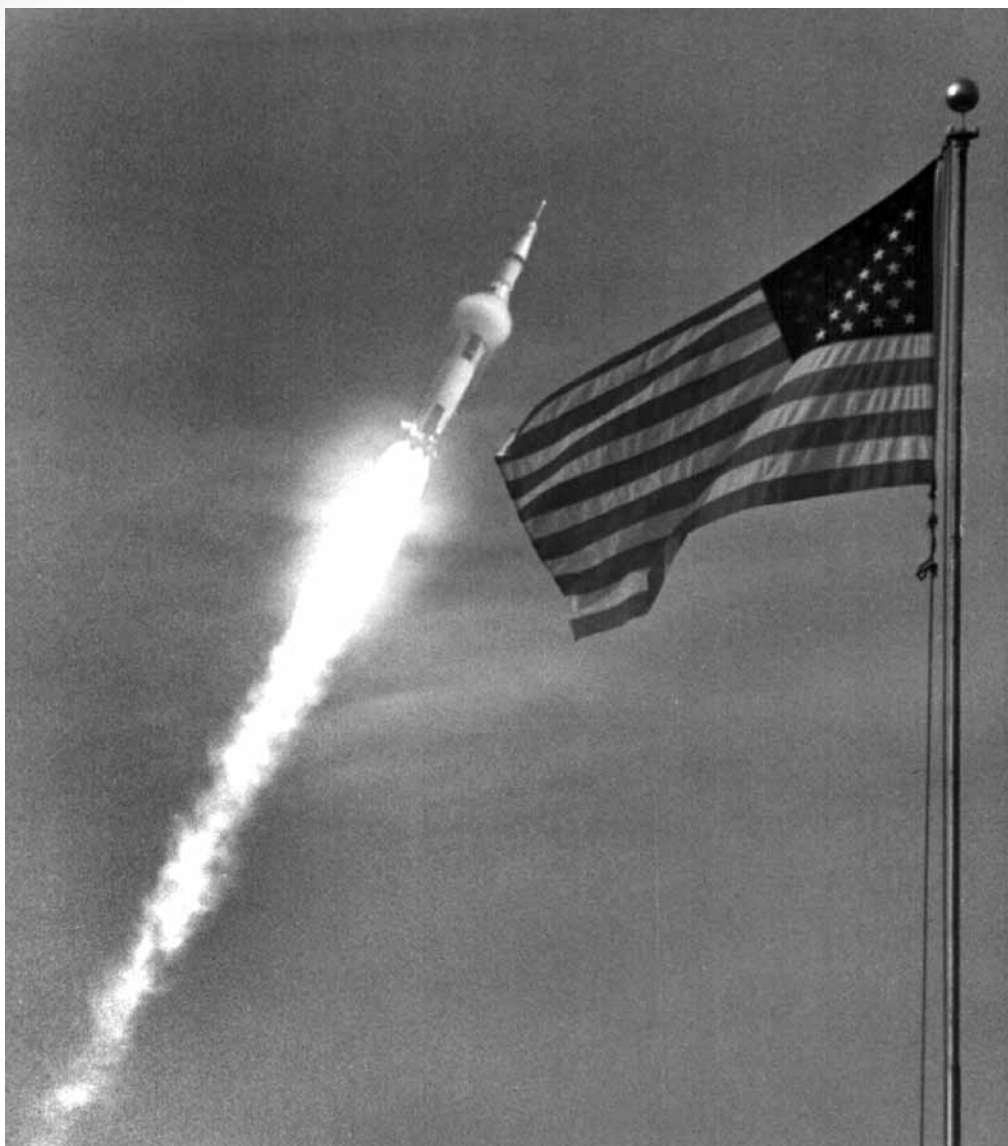


Larry R. Capps

Chief Executive Officer

U.S. Space & Rocket Center





The American flag heralds the flight of Apollo 11, the first lunar landing mission. The Apollo 11 Saturn V space vehicle lifted off at 9:32 a.m., EDT, July 16, 1969.

Apollo 40th Celebration Agenda



The U.S. Space & Rocket Center has dozens of permanent exhibits for your family to enjoy. For this anniversary celebration, there will be special Marshall exhibits on display in the Davidson Center.

Activities

All activities and exhibits are open 1–5 p.m. in the Davidson Center unless otherwise noted.

- **Ask an Engineer!** Apollo/Saturn and Constellation/Ares hardware displays staffed with Marshall's Apollo/Saturn, Space Shuttle, and Constellation program representatives.
- **First Footprints: Where Were You?** Share your memories of the day Neil Armstrong first set foot on the moon.
- Visit with an astronaut at the **Astronaut Station** and get autographed photos.
- Visit the student activity areas where learning about Ares and Orion can be fun!
- Visit the **Discovery Theater** in the main museum and watch a video on Wernher von Braun, "The Rocket Man," showing every half hour.
- Live entertainment
- Refreshments
- Photo kiosks

Davidson Center 3-D Theater

- 1:00–1:45 p.m. "Fly Me to the Moon" movie (\$5 admission)
- 1:50–2:20 p.m. Interactive Constellation (ICON) demonstration
- 2:30–2:50 p.m. Apollo History documentaries/videos
- 3:00–3:45 p.m. "Fly Me to the Moon" movie (\$5 admission)
- 4:00–4:45 p.m. "Thunder in Huntsville" video



Exhibits

Von Braun Tribute

View historical photos, video, and memorabilia honoring the life of space exploration giant, Wernher von Braun.

Apollo History

Explore each segment of the mighty Saturn V rocket, including first stage S-IC, second stage S-II, third stage S-IVB, Saturn instrument unit, and Apollo capsule.

Astronaut Station

Meet NASA astronauts who will be on hand to sign autographs 2–4 p.m.

Moonbuggy

The Huntsville Center for Technology exhibits their top-ranked moonbuggy and shares footage from Great Moonbuggy races.

UAH University Student Launch Initiative

Participants from the University Student Launch Initiative will showcase their rocket.

Ares I-X

Learn about the flight test vehicle that will bring NASA one step closer to exploring the moon, Mars, and beyond.

Ares

Explore the Ares I crew launch vehicle and the Ares V cargo launch vehicle.

Science Tower

Exploration Life Support Exhibit

Learn about the closed-loop urine/sweat reclamation and water-recycling system that is being developed and tested for use in future exploration missions.

Simulated Lunar Regolith Exhibit

Explore simulated lunar regolith — moon dirt — which will help NASA prepare for countless experiments on equipment, hardware, and spacesuits that will be used when NASA returns to the moon.





Common Extensible Cryogenic Engine (CECE)

Check out Marshall's development of the CECE, a deep-throttling engine that will allow a spacecraft to gently land on the lunar surface.

Launch Abort System

Learn about this important safety system, that will automatically separate the Orion spacecraft from the Ares I rocket should a malfunction in the launch vehicle occur.

Exploration Experience Pavilion

Step into a theater with an interactive floor that allows you to feel as if you are walking on the surface of the moon.

Lunar Precursor Robotics Program

Find out about the recent Lunar Reconnaissance Orbiter (LRO) and Lunar CRater Observation and Sensing Satellite (LCROSS) robotic missions, which are returning data to advance our knowledge of the lunar environment.

International Lunar Network Node

Learn about lunar robotic lander prototype testing at Marshall that will help scientists and engineers create components of an International Lunar Network.

Space Shuttle

Discover the space shuttle, NASA's reusable space vehicle designed to transport people, spacecraft, and equipment to and from low Earth orbit.

Where Were You? Video Booth

Where were you on July 20, 1969? Share your unforgettable memories from this historical day in our Where Were You? video booth.



The Apollo Story

It all started on May 25, 1961, when President John F. Kennedy announced the goal of sending astronauts to the moon before the end of the decade. Coming just three weeks after Mercury astronaut Alan Shepard became the first American in space, Kennedy's bold challenge set the nation on a journey unlike any other in human history.

Eight years of hard work by thousands of Americans came to fruition on July 20, 1969, when Apollo 11 commander Neil Armstrong stepped out of the lunar module and took "one small step" in the Sea of Tranquility, calling it "a giant leap for mankind."

The journey to the moon began in Huntsville, Alabama, with the design of the largest rocket ever built—the mighty Saturn V that launched all the Apollo missions. Several Apollo missions paved the way for Apollo 11 by testing the Saturn V, the Apollo capsule, and the lunar module. These flights culminated with Apollo 11, the first lunar landing.

In all, six missions landed on the moon, and 12 astronauts explored the lunar surface. They deployed instruments or performed experiments that studied regolith mechanics, meteoroids, heat flow, lunar ranging, magnetic fields, and solar wind. They brought back moon rocks that have revealed much about the moon and the Earth's geologic history.

Even during one of the most trying missions—Apollo 13—America's engineering ingenuity shined. An oxygen tank explosion forced Apollo 13 to scrub its lunar landing, but the "can-do" problem solving of the crew and mission control turned the mission into a "successful failure," and the crew was brought safely home to Earth.



The Saturn V Moon Rocket



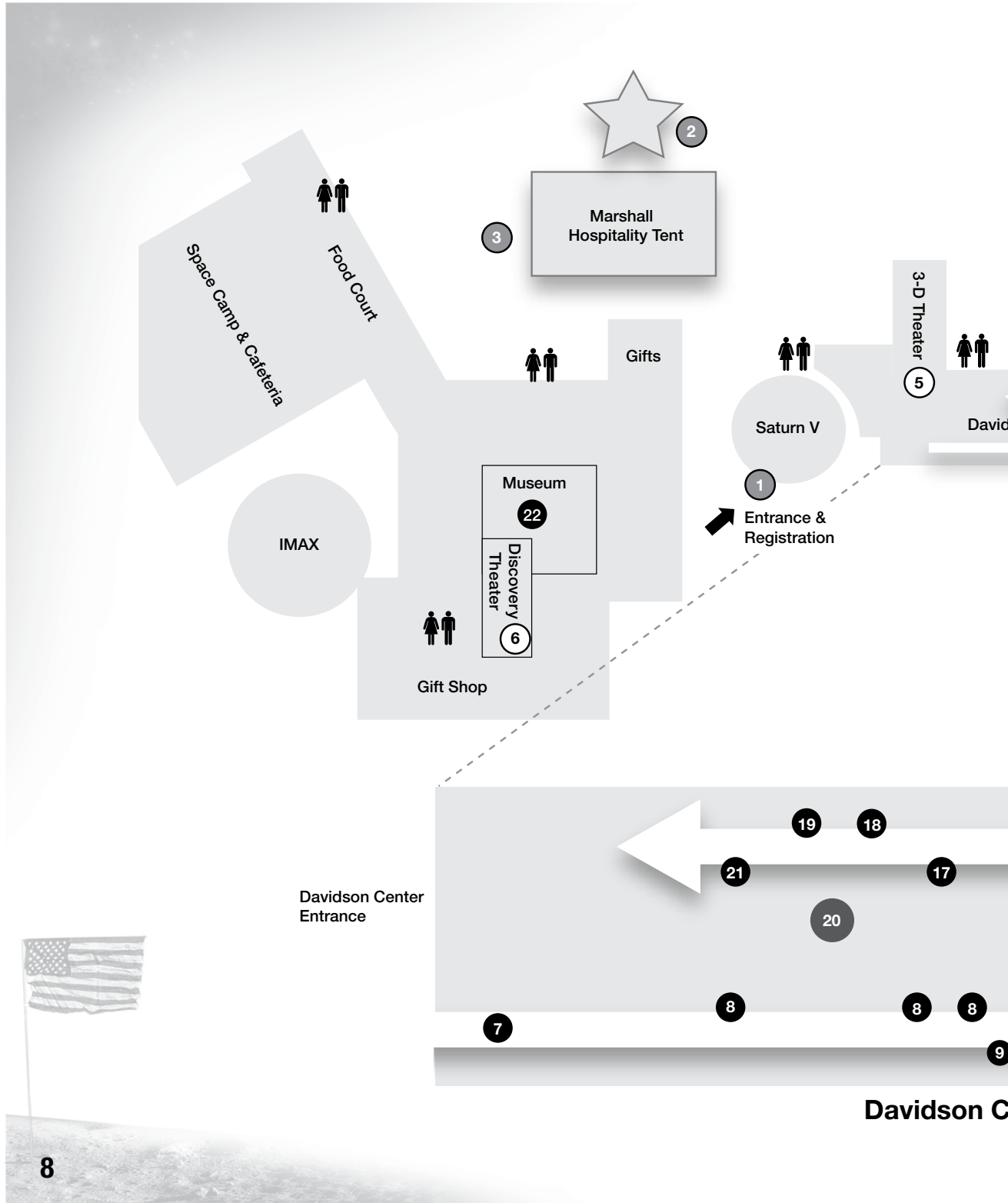
In 1961, America had flown only one person in space, and no rocket was capable of traveling to the moon. Alan Shepard made the first human space trip on a modified Redstone rocket designed and built in Huntsville, so the city had already been transformed from the “Watercress Capital of the World” to the “Rocket City.” Marshall Space Flight Center engineers and scientists were ready to build a moon rocket.

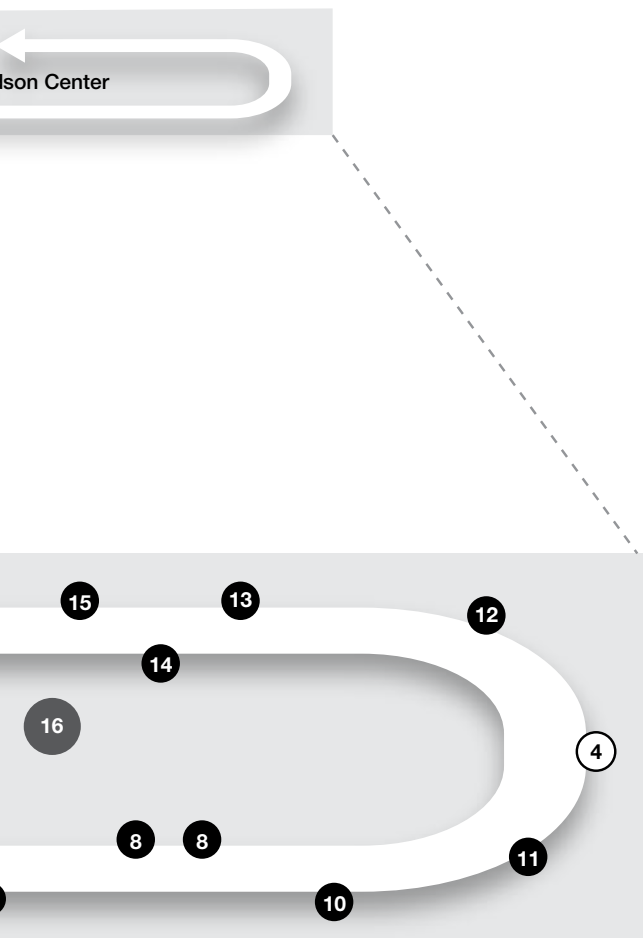
Unlike the Redstone and early rockets that were smaller and could be powered by a single engine, the Saturn V required many engines, stages, and propellants to provide enough energy to take people all the way to the moon. Towering at 363 feet (60 feet taller than the Statue of Liberty), the Saturn V is the largest, most powerful launch vehicle ever built.

The Saturn V had more than 3 million parts making up 700,000 components—designed, built, and tested at factories and test stands across America. At the height of the program, 20,000 companies were involved. From 1960 to 1964, test stands and manufacturing areas were built at Marshall, the Marshall-managed Michoud Assembly Facility in Louisiana, and other locations.

Now, thanks in part to the Saturn V and the Apollo missions, space is part of our everyday lives.







- ① Entrance & Registration
- ② Lunar/Mars Photo Kiosks & Live Entertainment
- ③ Refreshments
- ④ Restrooms

Media:

- ④ Large Screen Showings
- ⑤ Movies & Historic Footage
- ⑥ Wernher von Braun, "The Rocket Man"

Exhibits:

- ⑦ Von Braun Tribute
- ⑧ Historic Saturn Stages
- ⑨ Astronaut Station
- ⑩ University Student Launch Initiative
- ⑪ Great Moonbuggy Race Display
- ⑫ Where Were You? Video Booth
- ⑬ Space Shuttle
- ⑭ Ares I-X
- ⑮ Ares
- ⑯ Exploration Experience Pavilion
- ⑰ Common Extensible Cryogenic Engine
- ⑱ International Lunar Network Node
- ⑲ Lunar Precursor Robotics Program
- ⑳ Science Tower
 - Exploration Life Support
 - Simulated Lunar Regolith
- ㉑ Orion Launch Abort System
- ㉒ Children's Activities



Test Your Knowledge

1. What was the first mission to land on the moon?
 - a. Apollo 8
 - b. Apollo 11
 - c. Apollo 13
 - d. Apollo 18



2. Who was the last man to walk on the moon?
 - a. John Glenn
 - b. Neil Armstrong
 - c. Tom Hanks
 - d. Eugene Cernan

3. Of the 11 manned Apollo missions that launched, how many landed on the moon?
 - a. 11
 - b. 10
 - c. 6
 - d. 1

4. From 1969 on, each Apollo spacecraft was made up of three parts. What were they?
 - a. command module, service module, lunar lander
 - b. command module, canasta module, spelunker
 - c. defense module, lunar lander, Mars lander
 - d. command module, defense module, lunar lander

5. Which Apollo mission first used the Saturn V vehicle?
 - a. 1
 - b. 5
 - c. 8
 - d. 11

6. Which of these Apollo missions used a Lunar Roving Vehicle to explore the moon's surface?
 - a. 11
 - b. 12
 - c. 14
 - d. 15

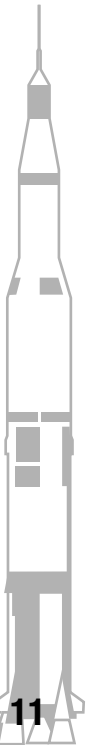
7. Which Apollo mission was the last of the numbered Apollo flights?
 - a. 15
 - b. 16
 - c. 17
 - d. 18

8. Which astronaut accompanied Neil Armstrong and Michael Collins on Apollo 11?
 - a. Eugene Cernan
 - b. James Irwin
 - c. Edwin Aldrin, Jr.



Answers:
1. b
2. d
3. b
4. a
5. c
6. c
7. d
8. c

-
- F A W F G B D
- Q R Y A R E S Y U
- S R B M O O C T K L S
- A P E R O R I O N G H H O
- C V A M N E R S N A O P U A L
- C R C E A R T H S X E T T S Y
- W M E E R T T Y U T I L P T T I O
- H A Y S R E S A Q E M N O L R P R
- Z R P T K A U S T L P O I E O G L
- S S I A H L A F P L S S O E N R W
- L T T Y T R V H A G J I N A T
- W E I R A T Y T T C U R E U S
- I O M I O O T I J E I C T
- N T R S W R O V E R C
- B Y U R E N S F N
- A B C H J W C



Scavenger Hunt

* Look for answers in the main museum and the Davidson Center.

1. Each Apollo astronaut was supplied with what type of watch? *

O _ _ G _

2. The moon rock on display came from which Apollo mission? *

T _ _ _ _ E

3. Which Apollo 11 astronaut (last name) wore his wedding ring to space? *

_ _ L L _ _ _

4. Which crew's mission patch has a ship as a tribute to the all Navy crew? *

_ W _ _ _ _

5. What brand of camera was used on the lunar surface? *

H _ S _ _ _ B _ _ D

6. Whose white flight suit is on display? *

Y _ _ N _

7. Which Apollo Flight Plan number is displayed in the Davidson Center?

E _ _ _ T

8. Who placed the American Flag on the Moon?

_ _ _ R _ N

9. What game is in the Mobile Quarantine Facility?

_ C _ _ B _ _ _

10. How many layers were there in an Apollo spacesuit?

2 _

11. What is the name of the Mattel® astronaut action figure on display?

_ _ S _ N

Answers:
1. Omega
2. Twelve
3. Collins
4. Twelve
5. Hasselblad
6. Young
7. Eight
8. Aldrin
9. Scrabble
10. 21
11. Mason





Apollo Spinoffs

With the success of the Apollo program, NASA made great progress in the fields of rocketry, aeronautics, and engineering. Many spinoffs resulted from the Apollo program.

True or False

1. Cool suits, which kept Apollo astronauts comfortable during moon walks, are worn today by race car drivers, shipyard workers, people with multiple sclerosis, and children with a congenital disorder that restricts the body's ability to cool itself.

TRUE

FALSE

2. Special kidney dialysis machines were created as a result of a NASA-developed chemical process that removes toxic waste from used dialysis fluid. The process saves electricity and eliminates the need for a continuous water supply, granting the patient greater freedom.

TRUE

FALSE

3. NASA space suit technology is used in the manufacturing process to fabricate basketballs.

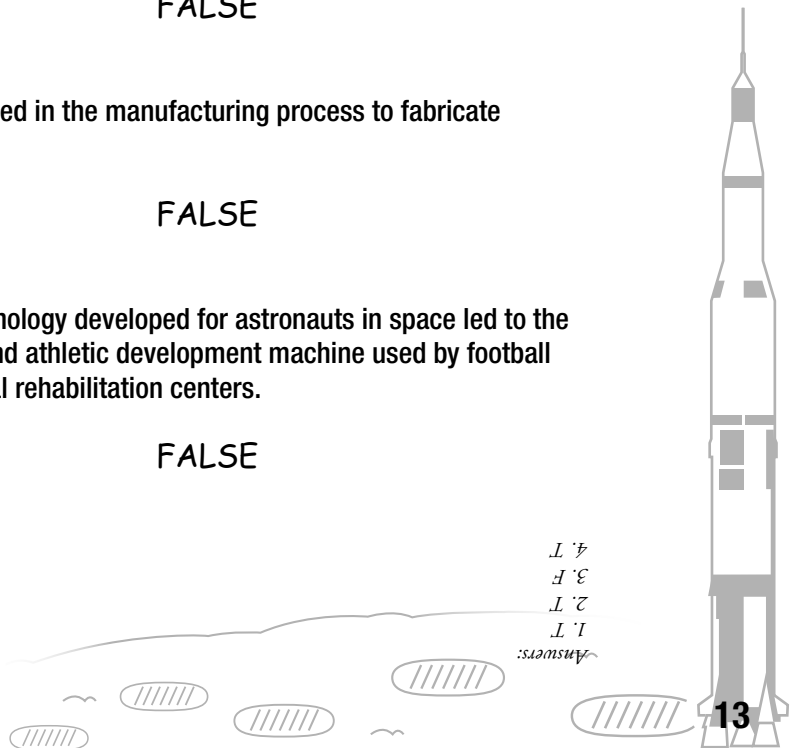
TRUE

FALSE

4. Cardiovascular conditioning technology developed for astronauts in space led to the invention of a physical therapy and athletic development machine used by football teams, sports clinics, and medical rehabilitation centers.

TRUE

FALSE





Word Scramble



See how many of these words you can unscramble!



olet rhig _ _ _ _ _

utarixcelerahv _ _ _ _ _

ronsatatu _ _ _ _ _

ahbttia _ _ _ _ _

trenaplopl _ _ _ _ _

stoundom _ _ _ _ _

drenal _ _ _ _ _

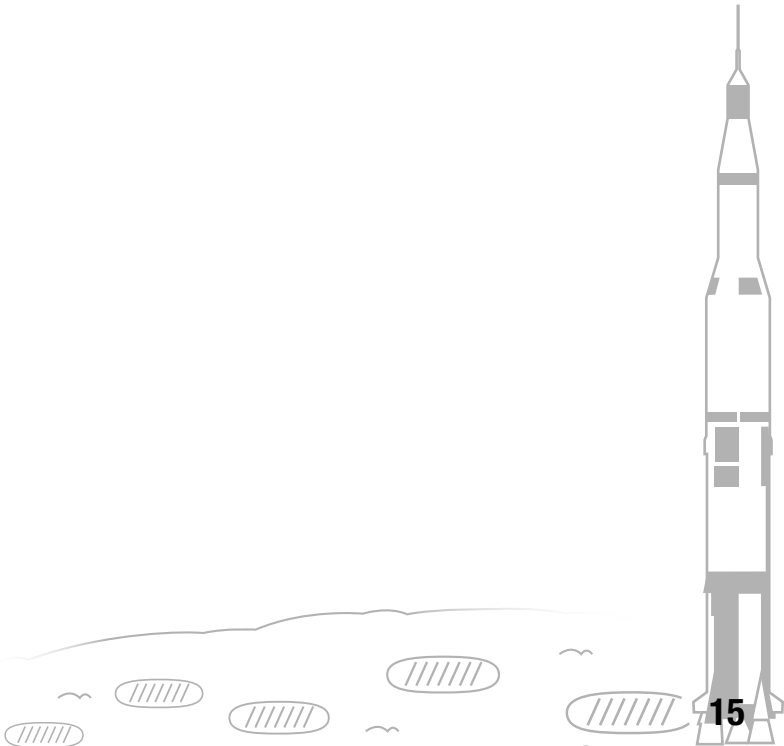
tectrax _ _ _ _ _

kecdofest _ _ _ _ _

Feedstock
Extract
Lander
Moon dust
Propellant
Habitat
Astronaut
Extravehicular
Regolith

Answers:

Autograph Page



Celebrating the Past, Launching the Future



The Apollo Program afforded the world the first views of our fragile planet. It was during the Apollo Program that humans witnessed the Earth rise from the blackness of space and got the first full view of the Earth.

This photo of Earthrise over the lunar horizon was taken by the Apollo 8 crew in December 1968, showing Earth for the first time as it appears from space.

In celebrating the accomplishments of the Apollo program, our eyes are on the future—using the technologies and lessons learned from the past to fuel future designs and innovations that will enable the next footprints on the moon.

Among our first steps in returning to the moon, the Lunar Reconnaissance Orbiter and the Lunar Crater Observation and Sensing Satellite robotic missions launched earlier this year to search for water on the lunar surface and lay the groundwork for scientific studies on the moon.

The journey of the Constellation Program is a long-term effort that has already begun. The Ares I-X test vehicle is being assembled for its test flight later in 2009. New technologies are being honed for production of the Ares I crew launch vehicle, which will take the Orion crew capsule into orbit, and the Ares V heavy lift vehicle that will carry the Altair lunar lander.

As we take these next steps toward future footprints on the moon and beyond, Marshall will continue to leverage the knowledge and technology from the first 50 years in space to launch a future that will again take us beyond Earth's orbit, exploring and returning benefits for all of mankind.





Launching the Future **OF SCIENCE AND EXPLORATION**

As the Marshall team comes together to celebrate the accomplishments of the Apollo program, one of mankind's greatest technological achievements, all eyes are focused on the future. From the development of mighty rockets to extraordinary scientific discoveries, Marshall Space Flight Center is launching the future of science and exploration.

National Aeronautics and Space Administration

George C. Marshall Space Flight Center

Huntsville, AL 35812

www.nasa.gov/marshall

www.nasa.gov

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